Benjamin Stockton

Doctoral Candidate & Research Assistant

Education

2019-Present **PhD in Statistics**, *University of Connecticut*, Storrs, CT.

2016-2019 **Bachelors of Science in Mathematics (Emphasis in Statistics)**, *University of Wisconsin-Whitewater*, Whitewater, WI.

2015-2016 **Bachelors of Science (Undeclared)**, *University of Wisconsin-Madison*, Madison, WI.

Work and Research Experience

June 2021 - Present **Research Assistant**, *University of Connecticut*, Storrs, CT.

- Supplemental Grant for NSF Grant # 2015320
- Overall NSF grant is for developing a model to classify bovid teeth fragments from hominid archeological site by species. This problem requires solving missing data problems in the context of shape analysis.
- Supplement is for my studies and research as an underrepresented minority hispanic student. The research goal of the grant is to develop missing data methods in the context of directional data including developing multiple imputation strategies for directional data in regression, time series, and spatio-temporal contexts.
- I have developed a novel imputation method for angular data based on predictive posterior draws from a projected normal regression to be used in multiple imputation. I have also spent time investigating potential methods for classification and clustering of incomplete angular and directional data.

June 2019 - July 2019 **Data Science Leadership Development Program Intern**, *Travelers Insurance Co.*, Hartford, CT.

- For the internship, I worked on a classification problem using XGBoost models and Natural Language Processing using python and various python packages such as pandas, numpy, scikit-learn, xgboost, and huggingface.

June 2019 - July 2019 **Colorado Summer Institute in Biostatistics (CoSIBS) Participant**, *Colorado School of Public Health*, Aurora, CO.

- I took an introductory course in applied biostatistics and methods of biostatistics.
- The program concluded with a project for which we analyzed and replicated the analysis of a paper on a clinical trial on the effectiveness of a new anti-malaria treatment.

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January 2018 - May 2019 **Undergraduate Research Assistant**, *Department of Mathematics, University of Wisconsin-Whitewater*, Whitewater, WI.

- Used College Algebra enrollment and course data to analyze how to more effectively place students in either standard or Moving Up sections using multiple measures.

May 2018 - July 2018 **Valparaiso University Mathematics REU Participant**, *Valparaiso University & NSF*, Valparaiso, IN.

- Member of a three person that completed a research project on the optimal creditworthiness threshold of a bivariate distribution.

June 2017 - May 2019 **Undergraduate Research**, *Department of Mathematics, University of Wisconsin-Whitewater*, Whitewater, WI.

- Interdisciplinary research project between Mathematics, Computer Science, and Psychology Departments focused on developing a web application to analyze the progression of STEM majors to graduation at UW-Whitewater.
- Assisted with data collection and visualization of baseball data for statistical research with other undergraduate math students.

October 2016 - May 2017 **Undergraduate Research Assistant**, *Department of Mathematics, University of Wisconsin-Whitewater*, Whitewater, WI.

- Worked with Math department enrollment data to better understand what factors cause students to change majors and course paths.

August 2015-August 2016 **Student Hourly for the Survey of the Health of Wisconsin**, *School of Medicine and Public Health, University of Wisconsin-Madison*, Madison, WI.

- As a student hourly employee, assisted with administrative tasks required by the study including scheduling appointments, preparing lab kits, scanning documentation, in-depth use of databases, preparation of materials for participant selection, and more tasks.

Mentoring

September 2022 - Present **Undergraduate Research Mentor**, *University of Connecticut*, Storrs, CT.

- Mentoring Sana Gupta, an undergraduate in statistics, on a project analyzing survey responses on motivations for exercising conducted by Katherine Gnall, a doctoral student in psychology. The project will be the basis for Sana's honors thesis.

Teaching

August2019 - May 2021 **Teaching Assistant**, *Department of Statistics, University of Connecticut*, Storrs, CT.

- Fall 2019 and Spring 2020 - Teaching Assistant for STAT 1000Q : Introduction to Stats I with Instructor Robert Apruzese
- Fall 2020 and Spring 2021 - Teaching Assistant for STAT 1100Q : Elementary Concepts of Statistics with Instructor Kathleen McLaughlin

September 2018 - May 2019 **Learning Assistant**, *Department of Mathematics, University of Wisconsin-Whitewater*, Whitewater, WI.

- Fall 2018 - Learning Assistant for Intro to Applied Statistics for Dr. Khyam Paneru. I primarily assisted students with learning to use R and applying R to statistical analysis for a final project.
- Spring 2019 - Learning Assistant for Introduction to Real Analysis for Dr. Wesley Hough

September 2016 - May 2018 **Tutor in the Math Learning Center**, *Department of Mathematics, University of Wisconsin-Whitewater*, Whitewater, WI.

- General tutor for courses including Pre-Algebra, Quantitative Reasoning, College Algebra, Finite Mathematics, Pre-Calculus, Calculus I, Calculus II, Calculus III, and Intro to Statistics

Projects

Incomplete Data Analysis in Literature on Sentencing Decisions

A collaboration between my advisor, Ofer Harel, C. Clare Strange, assistant professor of criminology and justice studies at Drexel University, and myself; we illustrated the impacts of using complete case analysis for incomplete data analysis via simulation study on the impacts of racial identity in sentencing decisions. As an alternative analysis, we used the MICE package to show that multiple imputation can be a viable method for unbiased estimation of regression coefficients. Published in the Journal of Quantitative Criminology.
`github.com/benjamin-stockton/missing-data-criminology`

CSE 5519 Introduction to Machine Learning Final Project

In this project, I worked with Yongqi Ni to develop several variations of the generalized extreme value loss function based on the Cauchy, Gumbel, Frechet, and Gaussian densities to be used in estimating time series with machine learning methods such as LSTM or GRU.
`github.com/benjamin-stockton/CSE_5819_Intro_ML_Project`

STAT 6315 Inference I Final Project

In this project, I conducted a literature review of cylindrical probability distributions which are characterized by the joint distribution of a circular or angular component and a (nonnegative) linear component. I then used a mixture distribution of Abe-Ley densities to model the distribution of wind directions and carbon monoxide at a weather station in Milwaukee, WI from 2017. Inference was performed in a Bayesian framework with the MCMC sampler implemented in RCpp.
`github.com/benjamin-stockton/STAT_6315_Final_Project`

STAT 5705 Introduction to Bioinformatics Final Project

For the final project of Introduction to Bioinformatics, Yunqi Wang and I worked with the MAGIC modeling framework for handling observation dropouts in single-cell RNA sequencing data. The MAGIC method was developed by Dijk et al. This method uses a distance metric to perform imputation of the missing data with a neighborhood of other points. In our project, we investigated the effect of the choice of the distance metric on the imputations and final results of a downstream clustering analysis.
`github.com/benjamin-stockton/STAT_5705_Project`

STAT 5825 Time Series Final Project

For the final project of the Introduction to Time Series course, I investigated the Distributed ARIMA (DARIMA) model for ultra-long time series by Wang et al. This model required setting up and running Spark to created a computing cluster.
`github.com/benjamin-stockton/STAT_5825_Project`

Recognition & Awards

2023 Summer Fellowship Award. Department of Statistics, University of Connecticut

2016 - 2019 University of Wisconsin-Whitewater Dean's List. Each semester from Fall 2016 through Spring 2019

2018 'Best Use of Data' Poster Award. University of Wisconsin-Whitewater Assessment Day for undergraduate research project on the academic progress of STEM undergrads.

2018 Marion B. Schlicher Scholarship.

2017 CK Flanagan Scholarship.

2016 University of Wisconsin-Madison Dean's List. Spring 2016

2015 UW-Madison Fort Atkinson Alumni Chapter/Pellegrin Scholarship. Fort Atkinson Community Foundation

2015 Theodore W. Batterman Scholarship. Fort Atkinson Community Foundation

2010 Helen Rose Inspire-a-Dream Scholarship.

Publications

1. Stockton, B., Strange, C. C., & Harel, O. (2023). Now You See It, Now You Don't: A Simulation and Illustration of the Importance of Treating Incomplete Data in Estimating Race Effects in Sentencing. *Journal of Quantitative Criminology*. `https://doi.org/10.1007/s10940-023-09577-w`
2. Stockton, B., & Harel, O. (2023). (Submitted to Annals of Applied Statistics) Imputation of Angular Missing Data by Bayesian Projected Normal Regression. *Annals of Applied Statistics*, *000*(000).
3. Sidi, Y., Stockton, B., & Harel, O. (2023). (Submitted to New England Journal of Statistics in Data Science) Non-inferiority clinical trials: Treating margin as missing information. *New England Journal of Statistics in Data Science*, *000*(000).

Conference Presentations

2023 ENAR Invited Session. 'Incomplete data in non traditional settings : Angles, Functions, and Shapes'

2018 National Conference on Undergraduate Research. 'Oral presentation on research from the project for evaluating undergraduate STEM student academic success'

2018 Indiana Mathematics REU Conference. Oral presentation on research on thresholds for credit-worthiness based on a bivariate distribution

Workshops (Attended)

2023 JSM Diversity Mentoring Program.

2023 ENAR Fostering Diversity Workshop.

2022 Field of Dreams Conference Presented by the Math Alliance.

2022 JSM Diversity Mentoring Program.

2022 ENAR Fostering Diversity Workshop.

2021 JSM Diversity Mentoring Program.

2021 ENAR Fostering Diversity Workshop.

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